

REMARKS

After the foregoing Amendment, claims 1-31, as amended, are pending in this application. Claims 1, 9, 17, 23, 30 and 31 have been amended to clarify their scope, thereby placing the application in better form for appeal. No new matter has been added to the application as a result of the amendments to claims 1, 9, 17, 23, 30 and 31.

Telephone Interview

Applicants wish to thank the Examiner for the courtesy of the telephone interview conducted on January 14, 2004. Applicant agrees with the content of the Interview Summary.

Rejection - 35 U.S.C. § 102

Claims 1, 4, 5, 9, 10, 13, 14, 23, 27, 28, 30 and 31 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No.5,956,077, hereinafter referred to as Qureshi et al. Applicant respectfully traverses the rejection.

Qureshi et al. does not teach, suggest or disclose an optical monitoring system including a hermetically sealed housing.

The Examiner states at paragraph 2 of the final Office action that Qureshi et al. discloses “a monitoring system comprising the same flexible, generally tubular, elongated housing having a distal end, a proximal end and an interior (see 31, 32, 37, 38 [and] 41 of Figs. 2 and 8), the housing being made of non-porous hermetically seal[ed], corrosive resistant material...”.

The structure in Qureshi et al. identified by the Examiner as the claimed housing, includes the inspection arm (21). The inspection arm is described by Qureshi et al. at col. 3, lines 16-17, as a series of separate, articulated segments 31-36 inclusive connected by a series of separated joints 37 (Fig. 8). Each joint has an associated servomotor 38 for rotating an associated segment about a pivot axis of the joint. A TV camera 41, lamps 49, 50 and a laser measuring device 51 are carried in a gimbal support 39 at the distal end of the inspection arm. An electronic controller 66 is interconnected with the servomotors, camera lamps and a measuring device by appropriate wires and slip rings (see col. 4, lines 3-6).

Amended claims 1, 9, 23, 30 and 31 of the present application each recite an optical monitoring system for transmitting images within the interior of a sealed chamber. The monitoring system includes a flexible, generally tubular, elongated, hermetically sealed housing rigidly secured to a wall of the chamber.

The structure (elements 31, 32, 37, 38 and 41) identified by the Examiner as corresponding to the claimed housing is not disclosed by Qureshi et al. as being hermetically sealed. Applicant further submits that there is no teaching or suggestion by Qureshi et al. that the disclosed structure is hermetically sealed or that it would be necessary to provide a hermetically sealed structure. Figs. 2 and 8 of Qureshi et al. merely disclose separate segments connected in series by joints, each of which joints having a pivot axis, without disclosing any sealing structure for achieving hermeticity in either the individual segments or for the structure as a whole. Applicant further submits that if Qureshi et al. had intended for the structure to be hermetically sealed, that feature would have been disclosed in the patent as an important design feature.

In order to anticipate a claim under 35 U.S.C. § 102, the reference must teach every element of the claim. MPEP § 2131. Applicant respectfully submits that because the Examiner has not identified any passage in Qureshi et al. that teaches, suggests or discloses that the structure identified by the Examiner as the housing is hermetically sealed, the § 102 anticipation rejection of claims 1, 9, 23, 30 and 31 should be withdrawn.

Qureshi et al. does not teach, suggest or disclose, a sealed window at the distal end of the housing.

Amended claims 1, 9, 23, 30 and 31 each recite a “sealed window at the distal end of the housing”... The Examiner states at page 2 of the Office action that the housing disclosed by Qureshi et al. includes a sealed window. The Examiner further states at page 8 that “it is clearly evident in Fig. 8 of Qureshi et al. that a window is being provided to protect elements 39, 41, 48-51 within the housing 31.” The Examiner further states that because the housing 31 is in fact being submitted to a hostile environment, it confirms the fact that there is a hermetically sealed window protecting elements 39, 41 and 48-51.

Section 2125 of the MPEP states:

“Drawings and pictures can anticipate claims if they clearly show the structure which is claimed. ... However, the picture must show all the claimed structural features and how they are put together.”

Figure 8 does not show a window protecting elements 39, 41 and 48-51. Further there is no teaching or suggestion in Qureshi et al. of a window covering elements 39, 41 and 48-51. A window, if it were present, should have been shown in the drawing by a conventional symbol of a transparent material (MPEP 608.02) and it is not. Further, the Examiner’s argument of a hostile environment as confirming the need of a sealed window is unpersuasive since the environment identified by Qureshi et al. is identified as being potentially unsafe only for humans and for causing tank corrosion. There is no teaching, suggestion or disclosure in Qureshi et al. that the environment would be damaging to elements 39, 41 and 48-51. Accordingly, Applicant submits that Qureshi et al. does not teach, suggest or disclose a sealed window at the distal end of the housing.

Applicant respectfully submits that because the Examiner has not identified any passage/drawing in Qureshi et al. that teaches, discloses or even suggests that the housing has a window at its distal end, the § 102 rejection of claims 1, 9, 23, 30 and 31 should be withdrawn.

Qureshi et al. does not teach, suggest or disclose that the proximal end of the housing is rigidly secured to the chamber wall at the access port to form a hermetic seal between the proximal end of the housing and the chamber.

Amended claims 1, 9, 17, 23, 30 and 31 each recite “the proximal end of the housing being rigidly secured to the chamber wall at the access port to form a hermetic seal between the proximal end of the housing and the chamber”.

At paragraph number 2 on page 2 of the final Office action, the Examiner states that the proximal end of the housing disclosed by Qureshi et al. is sealingly secured to the chamber wall at the access port, as shown by element 37 in Figure 2. In the first full paragraph on page 9 of the final Office action, the Examiner points out that the conical guide 23 shown in Fig. 2 provides the sealingly securing of the of the proximal end of the housing 37 to the chamber wall at the access port.

Initially, Applicant wishes to point out that element 37 is one of several joints in

the inspection arm (see col. 3, lines 16-18) and is not the proximal end of the inspection arm. Further, since the joints move up and down with the motion of inspection arm, Applicant fails to comprehend (and the Examiner does not explain) how a seal could be achieved between the joint 37 and the chamber.

On page 2 of the final Office action, the Examiner clearly equates the articulated inspection arm 21 comprising elements 31, 32, 37, 38 and 41 with the flexible housing recited in amended claims 1, 9, 17, 23, 30 and 31. The inspection arm 21 is described at col. 3, line 63 as being fixed to a belt 58 trained over a pair of pulleys 59, 61. The pulleys 59, 61 are mounted for rotation to a casing 20 which is admitted by the Examiner to be open at both ends. At col. 4, lines 25-28, the lower end of the casing 20 is described as being coupled to the manway 17 by an alignment cone 23.

Clearly, it is the casing 20 that engages the chamber by the alignment cone 23 and not the joint 37 of arm 21, as stated by the Examiner in the final Office action. Amended claim 1 recites that the proximal end of the housing is rigidly secured to the chamber wall. The term “secured” is defined in Websters as “:to make fast”. As described in Qureshi et al., the inspection arm 21 is free to move up and down within the casing 20, thus not conforming to the definition of secured as “make fast” and surely not being capable of being sealingly secured to the chamber wall, since the arm 21 actually makes mobile passage through the manway into the chamber. Thus, even though the arm 21 has a connection through the casing and the alignment cone to the chamber wall via the belt 58 and pulleys 59, 61, it is not rigidly secured to the chamber wall as recited in amended claims 1, 9, 23, 30 and 31. Further, there is no teaching, suggestion or disclosure that the alignment cone 23 forms a hermetic seal between the housing and the chamber wall.

Applicant respectfully submits that because the Examiner has not identified any passage/drawing in Qureshi et al. that teaches, discloses or even suggests that the proximal end of the housing disclosed by Qureshi et al. is rigidly secured to chamber wall at the access port to form a hermetic seal between the proximal end of the housing and the chamber, the § 102 rejection of claims 1, 9, 23, 30 and 31 should be withdrawn.

In summary, Applicant submits that Qureshi et al. does not teach, suggest or disclose either: (1) a hermetically sealed flexible housing, (2) a sealed window at the distal end of the housing or (3) a flexible housing hermetically sealed to a chamber. Accordingly, for all

the above reasons, Applicant requests reconsideration and withdrawal of the § 102 rejection of claims 1, 9, 23, 30 and 31.

Dependent claims 4, 5, 13, 14, 27 and 28 relate to the material from which the sealed window is formed as well as the manner in which the window is secured to the housing. As noted above, the Qureshi et al. patent does not disclose any such window and, accordingly, does not disclose or suggest a manner for securing the window to the housing. In supporting his rejection of these claims, the Examiner states "see window in front of elements 39, 41, 48-51 of Fig. 8". However, the Applicant can identify no such window on Fig. 8 nor is there any statement that the applicant can identify in the Qureshi et al. specification which, in any way, refers to or confirms the presence of any such window. Moreover, the applicant can find no statement of any kind regarding how any alleged window is or could be secured to the housing.

In order to anticipate a claim under 35 U.S.C. § 102, the reference must teach every element of the claim. "The identical invention must be shown in as complete detail as is contained in the ... claim." MPEP § 2131.

The Examiner has not identified any teaching in Qureshi et al. that teaches the material of which a window would be made or how such window would be attached to the housing. Accordingly, Applicant respectfully requests that the Examiner identify a specific portion of the specification in which the window is described along with the material for making the window and the manner in which the window is secured to the housing. In the absence of any such specific reference in the Qureshi et al. patent, it is respectfully submitted that the rejection of claims 4, 5, 13, 14, 27 and 28 should be withdrawn.

Further, it is respectfully submitted that since claims 1, 9, and 23 have been shown to be allowable, claims 4, 5, 10, 13, 14, 27 and 28 dependent on claims 1, 9 and 13 respectively are allowable, at least by their dependency. Accordingly, for all the above reasons, Applicants respectfully request reconsideration and withdrawal of the § 102 rejection of claims 4, 5, 10, 13, 14, 27 and 28.

Rejections - 35 U.S.C. § 103

Claim 6, 7, 17, 20 and 21

Claim 6, 7, 17, 20 and 21 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Qureshi et al. in view of U.S. Patent No. 3,778,170 (Howell et al.). It is the

Examiner's position that the Qureshi et al. patent discloses substantially the same optical system but does not disclose the housing including a borescope which is aligned with the sealed window. The Examiner further suggests that the Howell et al. patent discloses a borescope guide tube and teaches the conventional use of a fiber optic bundle borescope. The Examiner therefore concludes that it would have been obvious to one of ordinary skill in the art from the Qureshi et al. and Howell et al. references to develop the invention as set forth in claims 6, 7, 17, 20 and 21. For the reasons as set forth below, the Applicant respectfully traverses the rejection of these claims.

Applicant submits that Qureshi et al. and Howell et al. are not properly combinable under 35 U.S.C. § 103. The Examiner has not pointed to a specific objective teaching in either reference which would suggest the combination. Further, Applicant submits that one skilled in the art would not have considered the combination, because in so carrying out the combination, one would not have had a reasonable expectation of being able to insert a borescope through the separate articulated segments of the inspection arm described by Qureshi et al. to provide a viewing end aligned with the sealed window.

Additionally, as discussed above, Qureshi et al. does not teach or suggest either a hermetically sealed housing, rigidly secured to the wall of a container to form a hermetic seal, or a sealed window, as recited in amended claim 1. Claims 6 and 7 depend from amended claim 1. Accordingly, it is respectfully submitted that claims 6 and 7 distinguish patentably over the Qureshi et al. reference by virtue of their dependency and for the reasons as discussed above with respect to independent claim 1. The Howell et al. patent does not add anything to overcome the deficiencies of the Qureshi et al. patent with respect to independent claim 1. Accordingly, for all the above reasons, Applicant respectfully requests reconsideration and withdrawal of the § 103 rejection of claims 6 and 7.

Independent claim 17 recites, *inter alia*, a hermetically sealed housing containing a flexible borescope for transmitting images obtained through the window at the distal end of the housing, the sealed housing being rigidly secured to the wall of a chamber to form a hermetic seal with the chamber, and including a sealed window at the distal end of the housing.

As discussed above, Qureshi et al. does not teach or suggest either a hermetically sealed housing, rigidly secured to the wall of a container to form a hermetic seal, or a sealed window. While Howell et al. discloses a guide tube for directing a borescope, Howell et al. does

not teach or suggest a hermetically sealed housing, rigidly secured to the wall of a chamber to form a hermetic seal with the chamber, or a sealed window in the housing.

Further as discussed above, the combination of Qureshi et al. and Howell et al. are not properly combinable under 35 U.S.C. § 103. Accordingly, for all the above reasons, Applicant respectfully requests reconsideration and withdrawal of the § 103 rejection of claim 17.

Claims 20 and 21 depend from amended claim 17. Accordingly, it is respectfully submitted that claims 20 and 21 distinguish patentably over the Qureshi et al. and Howell et al. references by virtue of their dependency and for the reasons as discussed above with respect to independent claim 17. Accordingly, based at least on the dependency of claims 20 and 21 to amended claim 17, Applicant respectfully requests reconsideration and withdrawal of the § 103 rejection of claims 20 and 21.

Claims 2, 11, 18 and 25

The Examiner rejected claims 2, 11, 18 and 25 under 35 U.S.C. § 103(a) as being obvious from the Qureshi et al. patent in view of U.S. Patent No. 4,591,794 to Shattuck et al. It is the Examiner's position that the Qureshi et al. patent discloses the same optical monitoring system as discussed above with respect to claims 1, etc. and that the particular use of a stainless steel bellows for housing structures associated with borescopes and the monitoring of chambers is old and well recognized in the art as exemplified by the Shattuck et al. patent. The Examiner concludes that it would have been obvious to one of ordinary skill in the art having the Qureshi et al. and Shattuck et al. references in front of him along with general knowledge to provide a stainless steel bellows as set forth in claims 2, 11, 18 and 25. For the reasons as set forth in detail below, the Applicant respectfully traverses the rejection of claims 2, 11, 18 and 25.

It is respectfully submitted that the Examiner has improperly combined the Qureshi et al. and Shattuck et al. patents. The Examiner has not pointed to an objective teaching in the Qureshi et al. patent which would lead one skilled in the art to combine it with the Shattuck et al. patent. Similarly, the Examiner has not pointed to an objective teaching in the Shattuck et al. patent which would lead one to combine it with the Qureshi et al. patent.

Further, it is submitted that the Examiner has relied on nonanalogous art which is not pertinent to the problem with which the inventor was concerned for rejecting claims 2, 11, 18

and 25. Applicant, in conceiving the present invention, was presented with the problem of monitoring one or more parameters or making visual inspections of substantial portions of the interior of a sealed container having an environment hostile to the monitoring equipment, thereby requiring a flexible protective housing of the monitoring equipment. Qureshi et al. is directed to an inspection system which does not teach or suggest protection of the monitoring equipment. While Shattuck et al. suggests a bellows tubing for the distal end 42 of the housing 38, Shattuck et al: (1) discloses bellows tubing accommodating only conductors 60 and 66, and does not disclose housing monitoring equipment; (2) discloses bellows tubing which is open at one end, and thereby is not hermetically sealed and (3) is utilized as a rigid structure and not as a flexible sheath. Also, and most important, the probe 27 (including the bellows tubing) disclosed by Shattuck et al. is not disclosed or even suitable for housing a borescope, but, as clearly stated at col. 1, lines 64-66, the probe 27 as a whole is merely adapted for insertion into a borescope access port of an engine.

In addition to the above, the Shattuck et al. patent does not make up for the deficiencies of the Qureshi et al. patent as discussed above with respect to claims 1, 9, 17 and 23. Accordingly, for all the above reasons, Applicant respectfully requests reconsideration and withdrawal of the § 103 rejection of claims 2, 11, 18 and 25

Claims 3, 12, 19 and 26

Claim 3, 12, 19 and 26 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the Qureshi et al. patent in view of U.S. Patent No. 4,540, 258 to Chiodo. It is the Examiner's position that the Qureshi et al. patent discloses substantially the same optical monitoring system as claimed but does not specifically disclose the housing being comprised of a flexible polymeric tube. However, the Examiner's position is the use of a flexible polymeric tube for housing associated with a camera monitoring device is old and well recognized in the art as exemplified by the Chiodo patent. Finally, the Examiner concludes that claims 3, 12, 19 and 26 would have been obvious to one of ordinary skill in the art having the Qureshi et al. and Chiodo references before him/her. For the reasons as set forth below, the Applicant respectfully traverses the rejection of claims 3, 12, 19 and 26.

Claims 3, 12, 19 and 26 depend from independent claims 1, 9, 17 and 23, respectively. The Chiodo patent does not make up for the deficiencies noted above with respect

to the Qureshi et al. patent. Therefore, claims 3, 12, 19 and 26, distinguish patentably over the combination of references at least by virtue of their dependency and for the reasons as discussed above with respect to independent claims 1, 9, 17 and 23.

Further, it is respectfully submitted that the Examiner has improperly combined the Qureshi et al. and Chiodo patents and has not pointed to an objective teaching in either of these patents which supports his combination. As discussed in detail above, the Qureshi et al. patent is concerned with the inspection of a generally open railroad tank car whereas the Chiodo patent is concerned with a closed system employed for inspecting the interior of a body cavity. The Qureshi et al. device is not sealed, whereas the device of the Chiodo patent is clearly sealed. As discussed above with respect to claims 1, 9, 17 and 23, the Qureshi et al. patent does not disclose or suggest the use of a sealed window whereas the Chiodo patent does appear to disclose a window or at least a transparent portion of the sealed housing. Accordingly, it is respectfully submitted that since the Qureshi et al. and Chiodo patents were not properly combined by the Examiner that the rejection of claims 3, 12, 19 and 26 should be withdrawn.

Claims 8, 15, 16, 22, 24 and 29

Claims 8, 15, 16, 22, 24 and 29 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the Qureshi et al. patent in view of U.S. Patent Application Publication No. 2002/0116987 A1 to Braithwaite et al. It is the position of the Examiner that Qureshi et al. discloses substantially the same optical monitoring system as discussed above with respect to claim 1, 9, 17 and 23. The Examiner suggest that the Braithwaite et al. patent discloses an apparatus for measuring properties of material and teaches conventional fluid pressure control of an environment within the interior of a housing, temperature sensors and the use of infrared cameras for monitoring within the housing. The Examiner concludes that it would have been obvious to one of ordinary skill in the art having the Qureshi et al. and Braithwaite et al. references in front of him/her to provide the claimed subject matter of claims 8, 15, 16, 22, 24 and 29. For the reasons as set forth below, the Applicant respectfully traverses the rejection of these claims.

Claims 8, 15, 16, 22, 24 and 29 depend from claims 1, 9, 17 and 23 which, as discussed above, define patentably over the Qureshi et al. reference. The Braithwaite et al. reference does not make up for the above-discussed deficiencies of the Qureshi et al. patent with

respect to the independent claims. Accordingly, claim 8, 15, 16, 22, 24 and 29 distinguish patentably over the combination of the Qureshi et al. patent and the Braithwaite et al. publication at least by virtue of their dependency and for the reasons as discussed above with respect to the independent claims. Accordingly, the rejection of claims 8, 15, 16, 22, 24 and 29 should be withdrawn.

In addition, it is respectfully submitted that the combination of the Qureshi et al. patent and the Braithwaite publication is improper because the Examiner has failed to point to a specific objective teaching in either reference which would support their combination. Further, it is respectfully submitted that the two references, themselves, teach away from such as combination because the Qureshi et al. patent teaches a generally open system whereas the Braithwaite et al. publication teaches a sealed or enclosed system. It is therefore respectfully submitted that the rejection of claims 8, 15, 16, 22, 24 and 29 should be withdrawn.

Conclusion

In view of the foregoing amendment and discussion, it is respectfully submitted that the present application including claims 1-31, as amended, is in condition for allowance and such action is respectfully solicited.

Respectfully submitted,

MICHAEL J. POLLACK

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(Date)

By: 

LOUIS SICKLES II

Registration No. 45,803

AKIN GUMP STRAUSS HAUER & FELD LLP

One Commerce Square

2005 Market Street, Suite 2200

Philadelphia, PA 19103-7013

Telephone: 215-965-1200

Direct Dial: 215-965-1294

Facsimile: 215-965-1210

E-Mail: lsickles@akingump.com

LS:lcd
Enclosures